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The Ontology and Causation of Financial Regulatory Paradigm: The Nonreductive Individualism of Macroprudential Regulation*

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One of the most important changes in financial regulation after the global financial crisis of 2008 has been the emergence of macroprudential regulation. Although there has been the claim that the emergence of macroprudential regulation characterizes an ontological shift in financial regulation, this article argues that it is a misleading interpretation caused by a conflation of ontological and explanatory claims. Macroprudential regulation has not been derived from an ontological shift but rather from an explanatory shift because the macroprudential assumption that the aggregate is more than the sum of individual parts is a causal or analytical, rather than ontological, assumption. The theoretical foundation of macroprudential regulation can be defined as nonreductive individualism that reconciles ontological individualism with explanatory nonreductionism. In contrast to nonreductive individualism, macrosocial ontology assumes that social entity can be ontologically distinct from individuals because social structure produces observable effects by constraining or enabling the interactions of individuals. A change in ontological assumptions is the most important criterion according to which the meaning of policy change is evaluated. We can distinguish fundamental changes from incremental ones by investigating whether the ontological assumptions of policy paradigms are changed. In this regard, the emergence of macroprudential regulation can be defined as an incremental change in financial regulatory paradigm

Keywords: financial regulation, macroprudential regulation, social ontology, constructivist political economy

1. INTRODUCTION

After the global financial crisis of 2008, there has been a growing consensus among financial regulatory policymakers that there is a need to "strengthen the macroprudential orientation of financial regulation and supervision" (Clement, 2010: 59). Referred to as "a new ideology and a big idea" (Haldane, 2009), macroprudential regulation "has risen with breathtaking speed from virtual obscurity to currency in the policymaking world" (Borio, 2011: 1). With a focus on systemic risks endogenously generated by the collective, rather than individual, behavior of financial institutions, macroprudential regulation has changed the central focus of financial regulatory framework from the soundness of individual financial institutions to the soundness of the financial system as a whole.

Macroprudential regulation provides a new understanding of the root causes of financial instability and regulatory approaches to financial markets. Rejecting the premise that financial markets could be self-regulated by the prudential risk management of individual financial institutions, macroprudential regulation acknowledges the endogenous risks of financial markets that arise as the result of the interactions of individual prudential behaviors (Baker, 2010: 660-661). With an emphasis on the undesirable instability of the financial

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system caused by the collective behavior of prudential financial institutions, macroprudential regulation aims to deal with the "systemic risk" of financial markets, rather than the "idiosyncratic risk" of individual institutions, with an objective of "limiting the likelihood of the failure, and corresponding costs, of significant portions of the financial system" (Crokett, 2000).

Macroprudential regulation emphasizes that the prudential risk management of individual institutions is inadequate to maintain the stability of the financial system as a whole because of systemic risks generated by the result of the collective behavior of financial institutions. More specifically, macroprudential regulation take seriously the cross-sectional and time dimensions of financial risk in explaining the instability of the financial system. The cross-sectional dimension of systemic financial risk is related to correlations and common exposures among financial institutions. Macroprudential regulation focuses more on similar portfolio holding among interconnected institutions in the financial system, rather than risk concentration within individual institutions, since if all individual institutions have the same kind of risky assets, it could engender the instability of financial system regardless of the level of risk exposure of individual institutions by causing a system-wide deterioration of balance sheets (Datz, 2013: 471-472).

In terms of the time dimension of financial risk, macroprudential ideas put an emphasis on the procyclicality of financial markets. The tranquility period of financial markets tends to weaken risk perceptions and strengthen optimistic expectations, eventually leading to the booming phase of financial cycle in which the expansion of liquidity increases asset prices and creates a financial bubble. When financial actors suddenly realize the high degree of exposure to risk, however, demand for low risky and liquid assets rapidly increases, thereby leading to the contractive phase of financial cycle in which the contraction of liquidity causes the prices of financial assets to plummet and makes the bubble bust (Frenkel and Rapetti, 2009: 687). To alleviate procyclicality, macroprudential regulation stresses countercyclical capital buffers which help to reduce liquidity in the booming phase of the financial cycle and increase it in the contractive phase of the cycle.

There has been controversy surrounding the (potential) impact of macroprudential regulation on financial regulatory paradigm in the international political economy literature. The proponents of macroprudential have argued that although its fundamental meaning and instrumental mechanisms have not been fully appreciated and developed, macroprudential regulation has the potential to induce a fundamental change in the financial regulatory paradigm because the principles of macroprudential regulation are fundamentally different from neoliberal ideas in that they admit the endogenous nature of financial instability, thereby rejecting the self-regulation of financial markets and stressing the role of states in regulating financial markets (Baker, 2018; Baker and Widmaier, 2015; Best, 2016; Mackintosh, 2014).

In particular, the claim that macroprudential regulation can bring about a profound change in financial regulatory paradigm has been derived from the premise that a macroprudential call for the system as the primary scale of analysis has been accompanied by an ontological shift in financial regulatory paradigm. It is argued that the emergence of macroprudential regulation fits with a conception of paradigm shift termed by Khun (1962) or third-order change termed by Hall (1993) because its "macrosocial" ontology that "treats interactions between agents as having an independent standing, and sees the aggregate as more than the sum of individual parts" (Best and Widmaier, 2006: 617) represents a set of completely different assumptions about how financial markets are constituted and operate.

By and large, the critics of macroprudential regulation focus on the feasibility of

macroprudential regulation. Many of them have maintained that macroprudential regulation could not bring about only minor changes in financial regulatory paradigm since the meaning and policy significance of macroprudential regulation are vague and doubtful. According to them, the systemic risks on which macroprudential regulation focus are difficult to understand and identify. It is thus hard, if not impossible, to measure the systemic risks of financial markets and devise policy instruments to control systemic risks (Casey, 2015; Helleiner, 2014; Lombardi and Moschella, 2017; Mugge, 2014).

In contrast to the critics focusing on the feasibility of macroprudential regulation, this article deals with the fundamental principles of macroprudential regulation. It argues that the claim that the emergence of macroprudential regulation characterizes an ontological shift in financial regulatory paradigm is a misleading interpretation caused by "a conflation of ontological and explanatory claims" (List and Spiekermann, 2013: 641). Ontological claims are concerned about "what the social world *is* – its building blocks or what it consists of," whereas explanatory claims are about "how the social world *causally* works – what sequences of events lead to one another or what mechanisms are operative" (Epstein, 2015: 151, emphasis original). While the ontological claim of financial regulatory paradigm is about what consists financial markets and how they are constructed, the explanatory claim of financial regulatory paradigm enunciates causal processes or pathways through which the macro outcomes of financial markets are brought into being.

In understanding a change in financial regulatory paradigm, it is important to distinguish two distinct types of ideational shift in financial regulation: explanatory and ontological shifts. Although some proponents of macroprudential regulation argue that the core assumption of macroprudential regulation that the aggregate is more than the sum of individual parts causes an ontological shift in financial regulatory paradigm (Baker, 2018; Baker and Widmaier, 2015), this assumption should be seen as an explanatory, rather than ontological, assumption. The systemic risk on which macroprudential regulation focuses is caused by the complex interaction of self-interested rational individual actors. Therefore, the ontological assumption of macroprudential regulation can be characterized as individualistic, since macroprudential regulation does not acknowledge the ontological standing of social entity. What is novel for macroprudential regulation is its acknowledgement that the collective behavior of prudential financial institutions can bring about undesirable systemic outcomes. In this regard, the emergence of macroprudential regulation has not been derived from an ontological shift but rather from an explanatory shift in financial regulatory paradigm.

In order to clarify the difference between ontological and explanatory shifts in financial regulatory paradigm, this article seeks to distinguish macrosocial ontology from nonreductive individualism. Drawing on the philosophy of the mind and employing an analogy between the mental-physical relation and the social-individual one, some scholars have convincingly argued that ontological individualism is not only distinct from explanatory reductionism but also compatible with explanatory nonreductionism. Explanatory reductionism assumes that social properties at the macro level are identical and reducible to individual properties at the micro level, whereas explanatory nonreductionism acknowledges that social properties are not always identical and reducible to individual properties. In particular, nonreductive individualism is an ideational stance that reconciles explanatory nonreductionism with ontological individualism that social world is made up solely of individuals and thus social properties are determined by the interactions of individuals (List and Spiekermann, 2013; Sawyer, 2002, 2003).

In contrast to nonreductive individualism, macrosocial ontology assumes that social

entity can be ontologically distinct from individuals, particularly because social structure can produce observable effects by constraining or enabling the interactions of individuals (Wendt, 1987). The most crucial difference between nonreductive individualism and macrosocial ontology is their different understandings of *emergence*, which means "the appearance of novelty or something previously absent or unprecedented, somehow fashioned out of, if remaining dependent upon, matters already existence" (Lawson, 2016: 362). Nonreductive individualism views emergence in terms of causal relations: the interaction of individuals gives rise to new social properties that cannot be *causally* reduced to individual properties. In contrast, macrosocial ontology considers that social structures that emerge from the interactions of individuals in a diachronic sense are *ontologically* autonomous from individuals in a synchronic sense because they are constitutive of the social actions of individuals.

Although it is not easy to establish criteria to evaluate the meaning of policy change, paradigm shifts should be accompanied by a change in the ontological assumptions of policy paradigms because the ontological assumptions of policy paradigms are the fundamental principles that determine the social purposes and policy instruments of policy paradigms. Therefore, a change in ontological assumptions is the most important criterion according to which the meaning of policy change is evaluated. In other words, we can distinguish fundamental changes from incremental ones by investigating whether the ontological assumptions of policy paradigms are changed.

This article argues that the theoretical foundation of macroprudential regulation is not macrosocial ontology but rather nonreductive individualism. The focus of macroprudential regulation on systemic risks is derived from its nonreductionist explanatory assumption that collective outcomes resulting from the interaction of prudential individual actors can be undesirable for the financial system as a whole. While the relative novelty of macroprudential regulation is derived from its nonreductionist explanatory assumption, the conservative nature of macroprudential regulation results from its individualistic ontological assumption. In this regard, the (potential) impact of macroprudential ideas on financial regulatory paradigm would not be as fundamental as a paradigm shift in a Kuhnian sense. The emergence of macroprudential regulation after the global financial crisis of 2008 can be defined as an incremental change in financial regulatory paradigm (Onis and Guven, 2011: 470).

The paper is organized as follows. The first section explains the difference between ontological and explanatory assumptions of social explanation. The second section discusses the ontological and explanatory assumptions of macroprudential regulation. The third section explains how the macrosocial ontology of financial regulatory paradigm is different from the nonreductive individualism of macroprudential regulation. The study's conclusions are given in the following section.

2. ONTOLOGY AND CAUSATION

This section discusses theoretical arguments that justify a distinction between reductive individualism and nonreductive individualism not for the purpose of adjudicating which is a more appropriate approach to financial regulation but instead to clarify the ontological and explanatory assumptions of financial regulatory paradigm.

Prior to the global financial crisis of 2008, the dominant approach to financial regulation, which can be called microprudential regulation, focused on the soundness of individual

institutions. In contrast, macroprudential regulation whose importance has increased since the 2008 crisis has introduced 'the system' as the primary scale of analysis because it see financial risks as endogenously generated within the financial system by the collective behavior of individual financial institutions. It has been claimed that the difference in the primary scale of analysis between microprudential and macroprudential regulations is derived from their diametrically opposed ontological assumptions: macroprudential ideas endorse 'macrosocial ontology', as opposed to the 'individualistic ontology' of microprudential regulation (Baker, 2018; Baker and Widmaier, 2015).

To evaluate the claim that macroprudential regulation induces an ontological shift in the financial regulatory paradigm, it is important to distinguish ontological claims from explanatory ones: the former is about "what the social world *is* – its building blocks or what it consists of" and the latter about "how the social world *causally* works – what sequences of events lead to one another or what mechanisms are operative" (Epstein, 2016: 151). In particular, there are two different types of explanatory claims that are committed to ontological individualism: one assumes that ontological individualism necessarily entails explanatory reductionism and the other reconciles ontological individualism with explanatory nonreductionism. Following Sawyer (2002, 2003), we can call the former "reductive individualism" and the latter "nonreductive individualism."

Ontological individualism consists of two distinct claims: composition and supervenience. The composition claim of ontological individualism is that the social world is made up solely of individuals; the supervenience claim means that facts at the social level supervene on (are determined by) facts at the individual level (Ramstrom, 2018: 482). More specifically, supervenience individualism suggests that "if a collection of individual properties with a given set of relations causes a certain social property to obtain on one occasion, then that same collection of individual properties in that same set of relations on another occasion will cause the same social property to obtain" (Sawyer, 2002: 543). In other words, the supervenience claim of ontological individualism implies that social properties cannot change without a change in individual properties. The supervenience claim is a logical corollary of the composition claim of ontological individualism because if society consists of only individuals, a change at the social level should be generated by a change at the individual level.

Ontological individualism is sometimes conflated with explanatory reductionism, in which all social phenomena can be causally reduced to individual ones. For instance, John Stuart Mill argued that the social world or phenomena can be fully explained in terms of individual-level facts because social properties created by the interaction of individuals can be reduced to individual properties:

> The laws of the phenomena of society are, and can be, nothing but the laws of the actions and passions of human beings united together in the social state. … Men are not, when brought together, converted into another kind of substance, with different properties. … Human beings in society have no properties but those which are derived from, and may be resolved into, the laws of the nature of individual man (Mill, 1889: 573).

There is also a view that explanatory reductionism is not an unavoidable result of ontological individualism. For instance, Emile Durkheim endorsed ontological individualism but rejected explanatory reductionism:

> Whenever elements of any kind combine, by virtue of this combination they give rise to

> new phenomena. One is therefore forced to conceive of these phenomena as residing, not in the elements, but in the entity formed by the union of these elements. The living cell contains nothing save chemical particle, just as society is made up of nothing except individuals. … If, as is granted to us, this synthesis *sui generis*, which constitutes every society, gives rise to new phenomena … one is forced to admit that these specific facts reside in the society itself that produces them and not in its parts – namely its members (Durkheim, 1982: 39-40).

Durkheim's holistic approach to social phenomena is not an ontological claim but an explanatory one, with a focus on causal relations between lower-level (individual) properties and higher-level (social) ones (List and Spiekermann, 2013: 631; Sawyer, 2001: 558; Searle, 2006: 59-62). His approach can be understood as "property dualism, which holds that social properties may be irreducible to individual properties, even though social entities consist of nothing more than individuals" (Sawyer, 2002: 541). He argued that social properties "reside in the society … not in its parts" because the combination of individuals "gives rise to new phenomena," although "society is made up of nothing except individuals." In other words, he approved of ontological individualism but rejected explanatory reductionism.

What differentiates explanatory reductionism from explanatory nonreductionism is not the composition or supervenience claims of ontological individualism but type individualism, which means that every social property is identical and reducible to some individual-level properties (List and Spiekermann, 2013; Sawyer, 2002). While the composition claim of ontological individualism is necessarily related to its supervenience claim, it is not necessarily associated with type individualism in particular because of the multiple realizability of social properties, which means that although every social property supervenes on (is determined by) a combination of individual properties, the same social properties can be realized by multiple configurations of individual properties (Sawyer, 2001: 556-558). For instance, the instability of the financial system can be caused not only by the unreasonably risky behaviors of individual financial institutions but also by the complex interaction of individually prudential behaviors. When social phenomena characterized by the same property (financial instability) can be realized by distinct individual properties (risky or prudential), it remains valid that social phenomena are determined by individuals (supervenience individualism). However, it is difficult to maintain that social properties are identical and reducible to individual properties (type individualism) because different individual-level properties could give rise to the same social property. In this regard, given the multiple realizability of social properties, it can be said that "only individuals exist and that social entities do not have a distinct existence, yet there may be irreducible social properties" (Sawyer, 2001: 559).

Given the distinction between ontological individualism and type individualism, ontological individualism is compatible with both "phenomenal monism" that the properties of social phenomena are identical and reducible to individual properties and "phenomenal dualism" that social phenomena supervene on individuals but can have different properties from individual ones (Ramstrom, 2018: 482-485). In this regard, there can be two distinct social explanations informed by ontological individualism: reductive individualism and nonreductive individualism. Reductive individualism adheres to both ontological individualism and explanatory reductionism, whereas nonreductive individualism reconciles ontological individualism and explanatory nonreductionism. Both of these explanations rest on ontological individualism, acknowledging that only individuals exist in the social world and that social phenomena are determined by individuals. However, while reductive individualism endorses type individualism by regarding social properties as identical and

reducible to individual properties, nonreductive individualism maintains that there is no one-to-one correspondence between social and individual properties. In other words, nonreductive individualism accepts "analytical dualism," in which the analysis of social properties can be separated from the analysis of individuals, while rejecting "ontological dualism," in which social entities are autonomous from individuals.

3. THE NONREDUCTIVE INDIVIDUALISM OF MACROPRUDENTIAL REGULATION

The distinction between reductive individualism and nonreductive individualism discussed above is helpful for understanding the theoretical status of regulatory approaches to financial markets. The microprudential approach to financial regulation can be seen as being informed by reductive individualism that endorses ontological individualism and explanatory reductionism because it maintains that "financial stability is ensured as long as each and every institution is sound" (Crockett, 2000). The ontological assumption of microprudential regulation is that financial markets are made up of nothing except individual institutions and, thus, that there are no entities to be addressed other than individual institutions. As a result, microprudential regulation focuses only on the behaviors of individual institutions. In addition, it also adheres to explanatory reductionism, assuming that the properties of the financial system as a whole are identical and reducible to those of individual institutions. Consequently, microprudential regulation presupposes that the soundness of individual institutions will result in the soundness of the financial system as a whole because its explanatory reductionism "equates the macro sphere and the micro sphere" (Colander et al., 2009: 358).

In contrast, macroprudential regulation endorses nonreductive individualism with a view that systemic outcomes are determined by the collective, rather than individual, behavior of financial institutions. The key conceptual tool of macroprudential regulation in understanding systemic outcomes is the notion of a 'fallacy of composition' (Baker, 2013b: 115), which indicates that "what constitutes prudent behavior from the point of view of one institution may create broad problems when all institutions engage in similar behavior" (Jacome and Nier, 2012: 30). The fallacy of composition in the financial market implies that the soundness of individual institutions can differ from the soundness of the financial system as a whole because individual institutions seeking to make themselves safer "can behave in a way that collectively undermines the system" (Brunnermeier et al., 2009: xvii). For instance, in a recession, selling assets and/or tightening lending standards can be seen as reasonable and even compelling in order to maintain the soundness of individual institutions when they are considered in isolation. If every institution simultaneously seeks to do the same thing, however, credit-crunch and fire-sale effects could result, thereby deteriorating the soundness of the entire financial system (Hanson et al., 2011: 5-7). Given the fallacies of composition, the systemic properties of financial markets generated by the complex interaction of individual institutions are not identical to individual properties. Therefore, the maintenance of financial stability should be viewed "from a system perspective, rather than from the point of view each individual financial institution" (Morris and Shin, 2009: 233).

Some have argued that the systemic perspective of macroprudential regulation has been derived from its "macrosocial" ontology that "treats interactions between agents as having an independent standing, and sees the aggregate as more than the sum of individual parts" (Best and Widmaier, 2006: 617). According to this view, the macrosocial ontology

of macroprudential regulation "does not see the world as being just made up of atomistic individuals, but also includes social entities and forces that possess an autonomous standing" (Baker and Widmaier, 2015: 376-377). However, it is misleading to see the central focus of macroprudential regulation on systemic risks as the result of macrosocial ontology. In terms of ontological assumption, macroprudential regulation is not distinct from microprudential regulation: both are founded on ontological individualism in the sense that they explain systemic outcomes as the result of the action and interaction of individual financial institutions, disapproving of any entities that possess an independent ontological standing except for individual institutions.

Rather, the systemic perspective of macroprudential regulation results from its nonreductionist explanatory assumption, which sees the aggregate as more than just sum of its individual parts because the complex interaction of individual institutions characterized by the fallacies of composition gives rise to the distinct properties of the financial system from those of individual institutions. Macroprudential regulation considers not a systemic entity but rather the complex interaction of individual institutions as a main factor affecting the stability of the financial system as a whole. In this regard, the theoretical assumption of macroprudential regulation can be understood as nonreductive individualism because it rejects the explanatory reductionism of microprudential regulation without abandoning ontological individualism. It sees the financial system as constituted by individual institutions but argues that systemic outcomes are not simply the aggregation of individual properties.

The nonreductionist explanatory assumption of macroprudential regulation renders it distinct from the microprudential one by changing the central focus of financial regulation from the action of individual institutions to their interaction. However, their shared ontological individualism makes them similar and compatible in the sense that both seek only to regulate individual institutions, although macroprudential regulation is concerned about the soundness of the system as a whole and microprudential regulation about the soundness of individual institutions. Because its ontological assumption does not recognize any social entities except for individual institutions, macroprudential regulation also seeks to "manage system-wide dynamics by focusing on individual institutions" (Best, 2016: 50-51).

In terms of the time dimension of systemic risks, macroprudential ideas stress that prudential regulation should be tightened in booms and eased in recessions in order to flatten financial cycles. The regulatory measure of macroprudential regulation for rectifying the procyclicality of financial markets is to impose additional countercyclical capital buffers on *individual* institutions. With regards to the cross-sectional dimension of financial risks, macroprudential regulation calibrates prudential standards for individual institutions according to their systemic significance. It therefore seeks to impose more stringent regulations and conduct more careful monitoring on systemically important *individual* institutions whose failure could cause system-wide spillover effects (Borio, 2011; Brunnermeier et al., 2009; Crockett, 2000; Haldane, 2009; White, 2004).

In addition, the common individualistic ontology of microprudential and macroprudential regulations enables regulatory compatibility or harmony between them. Macroprudential regulation is not intended to replace microprudential regulation but rather to complement it by filling a regulatory loophole left by microprudential regulation (Baker, 2013a: 427; Casey, 2015: 364; Jacome and Nier, 2012: 30). Macroprudential proponents stress "the need to *supplement* microprudential regulation with macroprudential regulation" (Brunnermeier

et al., 2009: xviii; emphasis added).[1] The explanatory nonreductionism of macroprudential regulation makes it possible to identify systemic financial risks caused by the complex interaction of individual institutions, which could not be explained by the explanatory reductionism of microprudential regulation. However, the individualistic ontology of macroprudential regulation makes it dependent on 'micro' regulatory measures for 'macro' systemic problems, thereby rendering it compatible with microprudential regulation.

Macroprudential regulation has changed the focus of financial regulation from individual actions to their interactions. This change is induced by an explanatory, rather than ontological, shift. Macroprudential regulation ontologically recognizes nothing but individual institutions and thus seeks only to regulate individual institutions to rectify the fallacies of composition in financial markets. In this regard, it seems inappropriate to pose as an intriguing puzzle "a gap between the latent critical nature of that [macroprudential] ontology and the relatively conservative policy activity emerging from it" (Baker, 2018: 295), because the ontological claim of macroprudential regulation is not different from that of microprudential regulation. Macroprudential regulation results in "the relatively conservative policy activity" not only because they are still in a phase of experimentation but also because they share an individualistic ontological assumption with microprudential regulation. There is no such thing as "the latent critical nature" of macroprudential ontology. In other words, while the relatively novelty of macroprudential regulation is derived from its nonreductionist explanatory assumption, the conservative nature of macroprudential regulation results from its individualistic ontological assumption.

4. THE MACROSOCIAL ONTOLOGY OF FINANCIAL REGULATORY PARADIGM

The nonreductive individualism of macroprudential regulation sees systemic outcomes as emergent from the complex interaction of individual institutions. In contrast, the macrosocial ontology of financial regulatory paradigm acknowledges the ontological status of social structure and seeks to explain the micro-level actions and interactions of individuals with macro-level structural properties. Social structure is of a dual nature in the sense that it provides a platform for individual actions and it is in turn formed by these actions (Giddens, 1979: 69). From the perspective of a diachronic or historical process, the current social structure is the result of the social interactions of individuals in the past. However, from a synchronic viewpoint, the current social structure is the mechanism by which individuals interact with each other and thus it is an entity that precedes the actions of individuals. That is, from a diachronic viewpoint, social structure postdates individual actions, but social structure predates individual actions from a synchronic viewpoint (Archer, 1982: 467-468). In this sense, social structure and individuals are "mutually constitutive yet ontologically distinct entities" (Wendt, 1987: 360).

There are two distinct understandings of social structure. A material understanding of social structure regards it as an incentive structure faced by individuals (Waltz, 1979). Since the outcome of a particular action depends on the incentive structure within which individual

[1] Given the 'incommensurability thesis' of Kuhn's (1962) paradigm shifts that different paradigms are not only incompatible but also incommensurable with each other (Blyth, 2013), the compatibility between microprudential and macroprudential regulatory measures also makes it difficult to describe the emergence of macroprudential regulation as a fundamental paradigm shift in a Kuhnian sense.

actions take place, individuals always bear the impact of the incentive structure on their actions in mind when deciding their actions. In this regard, incentive structure constrains individual actions. In contrast, an ideational understanding of social structure construes it as a generative structure that enables the social actions of individuals (Wendt, 1999). The social action of individuals is not the sum of isolated individual actions, but a part of collective action. The individual intentionality of social action is embedded in collective intentionality and thus social action presupposes the existence of collective intentionality (Searle, 1995). Ideational generative structures are collective or intersubjective understandings that constitute individual actions as part of collective actions by providing "reasons why things are as they are" and defining the boundary of a socially "accepted way of proceeding" on the basis of which individuals form expectations and make decisions (Adler 1997, 322-323; Lawson 2012, 360-361).

4.1. The Material Understanding of Social Structure

The material understanding of social structure interprets social structure as an incentive structure that constrains the action and interaction of individual actors. According to this view, the global financial crisis of 2008 was fundamentally caused by structural changes in global financial markets that started in the 1980s. Relatively tight financial regulations including capital controls were established after the Bretton Woods Conference of 1944, but began to disintegrate in the 1980s, thereby giving rise to the globalization and deregulation of financial markets (Helleiner, 1994). These structural changes of global financial markets reflected the interests of large financial institutions headquartered in New York and London (Bhagwati, 1998: 10-12; Frieden, 1991: 440-441). Once changes are in place, however, financial globalization and deregulation act as structural pressures that systemically alter the calculation of financial actors and thus constrain their behavior. In this sense, financial globalization and deregulation can be regarded as being "fully consistent with Waltz's underlying conception of a structural feature of international politics: a constraining condition which rewards certain behaviors and punishes others" (Andrews, 1994: 202).

Financial globalization and deregulation have brought about fierce competition among financial institutions. The increasingly intense competition "simultaneously drove down returns on assets and drove up target returns on equity" (Haldane, 2009). As a result, financial institutions were forced to resorted to excessive risk-taking. They sought to increase revenues by relying on increasingly more excessive leverage (Hanson et al., 2011: 20-23). In the course of the global financial crisis, financial institutions increased mortgage lending and created structured securities by relying on excessive leverage in the form of commercial paper (CP) and repurchase agreement (repo) transactions. With growing instability of the US housing market, however, financial institutions such as Bear Stearns and Lehman Brothers had difficulty in extending credit on maturing CPs and repos and thus were caught in a liquidity crisis (Brunnermeier, 2009).

Financial institutions took on excessive leverage not because they could not rationally appraise the risk involved. This excessive risk-taking behavior was in line with the incentive structure created by financial globalization and deregulation. In the 1980s and 1990s, financial institutions were the "Masters of the Universe" in the sense that they generated the structural changes of financial globalization and deregulation. However, once the structural changes were in place, they "were quickly overwhelmed by forces they had not anticipated and were revealed as almost Slaves of the Markets they had helped create" (Bell

and Hindmoor, 2015: 2). Financial globalization and deregulation created a competitive environment by enabling free capital flows and financial innovations across the globe. The fierce competition caused by financial globalization "encourage[d] rational, risk-calculating market participants to take excessive risks" (Nelson and Katzenstein, 2014: 370-372). To survive the excessively competitive environment of financial globalization, financial institutions were forced to choose risky but profitable activities.

According to the material understanding of social structure, the main cause of the 2008 financial crisis was the structural change of the global financial market, namely globalization and deregulation, which had been underway since the 1980s. Financial globalization and deregulation created an incentive structure of fierce competition, forcing financial institutions to resort to excessive risk-taking to survive the competition. Eventually, such risky activities relying on excessive leverage drove many large financial institutions to collapse, which led to the global meltdown of financial markets. In this regard, the material understanding of social structure holds that financial stability cannot be secured by managing the micro-level action of individual financial institutions, but only by changing the macro-level structure that constrains their activities.

4.2. The Ideational Understanding of Social Structure

The ideational understanding of social structure construes social structure as collective or intersubjective understandings that can be defined as a "collectively accepted system of constitutive rules." While *regulative* rules constrain human action and interaction with an aim to "regulate antecedently existing activities" that are performed prior to and independently of the existence of regulative rules, *constitutive* rules are enabling rather than constraining in the sense that they do not merely regulate existing activities but "create the very possibility of certain activities" that regulative rules aim to constrain (Searle, 1995: 27-28). More specifically, constitutive rules make social action possible by assigning social status to objects or persons in the form of *X count as Y in context C*. For instance, a particular piece of paper performs a function as money not by virtue of its intrinsic features but by virtue of the collective assignment of its status as a legal tender through the constitutive rules of an institutional monetary structure (Searle, 1995).

The ideational understanding of social structure sees financial institutions and products as social objects whose functions are not performed because of their intrinsic qualities but because of its social status (Mugge and Perry, 2014: 200-201). Financial values are not a 'brute fact' that exists independently of human consciousness and intentionality but an 'social fact' whose existence requires human agreements and institutions due in a large part to uncertainty prevalent in financial markets, in which "there is no scientific basis on which to form any calculable probability whatever" (Keynes, 1937: 214).[2] In the context

[2] It is important to note that uncertainty is different from complexity. For example, the game of chess is complex but not uncertain (Katzenstein and Nelson, 2013: 1103). As Lockwood (2015: 727-728) notes, uncertainty refers to "outcomes in non-deterministic open systems, in which prediction is impossible not because of epistemological limitations on the part of the observer but because the structure of the system is such that its behavior is not amenable to prediction." Macroprudential ideas stress the complexity of financial markets, which prevents individual institutions from identifying and managing systemic risks. In contrast, social constructivist ideas are centred on uncertainty, which makes financial transactions rely on a collectively accepted system of rules.

of uncertainty, as Keynes (1936: 156) has famously described, the valuation process of financial assets resembles a beauty contest in which market participants seek to anticipate "what average opinion expects the average opinion to be" because uncertainty makes it impossible to construct a precise calculation about the probabilities of payoffs and the size of those payoffs (Nelson and Katzenstein, 2014). Facing uncertainty in which there is no solid anchor for constructing rational expectations, financial investors look to collectively formed understandings to classify financial assets, form their expectations and settle on their decisions. In this regard, financial valuations and transactions are conducted not on the basis of 'rational expectations' but on the basis of 'intersubjective expectations' (Hall, 2009; Mugge and Perry, 2014; Stellinga and Mugge, 2017).

According to this view, financial transactions can be seen not as a strategic interaction between instrumentally rational investors constrained by regulative rules but as a social interaction in which the exercise of instrumental rationality is constituted by intersubjective expectations generated by constitutive rules. At the heart of the constitutive rules of financial markets are 'calculative devices,' such as valuation models and risk management techniques, that make certain things count as tradable assets by enabling the collective assignment of social status in the process of standardizing, classifying and differentiating them (Langley, 2010; MacKenzie, 2006). A market is not just a place in which transactions take place but "a collective device for the evaluation of goods" in the sense that economic transactions depend on "a compromise not on values but on the instruments that calculate values" (Callon and Muniesa, 2005: 1239-1245). Therefore, the very existence of markets relies on socially authoritative calculative devices shared by market participants.

In the case of the 2008 financial crisis, what turned the US housing market bubble into the worldwide financial crisis was structured financial products such as mortgage-backed securities (MBSs) and collateralized debt obligations (CDOs), the essence of which was "the pooling of economic assets like loans, bonds, and mortgages, and the subsequent issuance of prioritized capital structure of claims, known as tranches, against these collateral pools" (Coval et al., 2009: 3). These structured financial products were so complex and opaque that their intrinsic values could not be correctly priced in the market. When the prospects of markets became murkier, the complex and obscure nature of the products caused demand for them to evaporate and their prices to plummet. As a result, a liquid market of structured financial products turned into an illiquid market, thereby jeopardizing the entire financial system (Acharya and Richardson, 2009; Crotty and Epstein, 2009; Helleiner, 2011; Lawson, 2009).

The explanation of the 2008 crisis requires an answer to the question of how it is possible that such complex and obscure products were constructed and transacted in the market prior to the crisis, that is, the ontological conditions of structured finance. Although the profit-maximizing motives of financial investors were indispensable, the existence of structured finance was made possible because "a certain industry standard has been established for the pricing and risk management of these products" (Colander et al., 2009: 253). In other words, what enabled the construction and transaction of a large volume of these complex products was commonly shared calculative devices that collectively assigned social status to them. Socially authoritative valuation models such as the Black-Sholes model and the one-factor Gaussian copula model, risk management techniques such as the value-at-risk model, and credit ratings assigned by the big three credit rating agencies (Standard & Poor's, Moody's and Fitch) made it possible to standardize, classify and differentiate structured financial products, thereby creating intersubjective expectations among financial investors that allowed

them to transact enormous volumes of complex financial products prior to the 2008 financial meltdown (Lindo, 2018; Lockwood, 2015; MacKenzie, 2011). In this respect, the global crisis of 2008 can be seen as a 'valuation crisis' in which an increase in subprime mortgage default seriously damaged the functioning of existing constitutive rules, such as socially authoritative valuation models and risk management techniques. This valuation crisis made it impossible for financial actors to collectively constitute intersubjective expectations and thus prevented them from conducting stable financial transactions with each other, eventually resulting in a liquidity crisis in which large financial institutions collapsed (Palan, 2015; Sinclair, 2009).

According to the ideational understanding of social structure, financial stability is fundamentally dependent not on the action and interaction of rational individual actors but on the stability of the accepted system of constitutive rules that creates the intersubjective expectations of financial investors by standardizing, classifying and differentiating financial assets through the collective assignment of social status to them.

5. CONCLUSION

The emergence of macroprudential regulation, which aims to ensure the soundness of the financial system rather than that of individual institutions, has been accompanied by an ideational shift from a partial equilibrium analysis with a focus on the individual behavior of financial institutions into a general equilibrium analysis with a focus on the interaction between these institutions (Thiemann et al., 2018). However, this ideational shift of macroprudential regulation cannot be characterized as an ontological shift from individualistic ontology into macrosocial ontology. In terms of ontology, macroprudential regulation is not different from microprudential regulation: both commit to ontological individualism by treating economic transactions as interplays between 'isolated atoms' that exist independently of social structures (Lawson, 2009). Rather, macroprudential regulation is characterized by a causal-explanatory shift from reductionism into nonreductionism with an emphasis on 'emergent systemic properties' resulting from the complex interaction of financial institutions.

While the nonreductive individualism of macroprudential regulation stresses that the social interaction of individuals is not *causally* equal and reducible to the sum of individual actions because social interaction gives rise to new social properties, the macrosocial ontology of financial regulatory paradigm maintains that social structure cannot be *ontologically* reducible to individuals because social structure constrains or enables the social action of individual actors. The material understanding of social structure notes that the intensification of competitive pressure precipitated by financial globalization led to the risky behavior of financial institutions and emphasizes the importance of reforming the material incentive structure, namely financial globalization. The ideational understanding of social structure emphasizes constitutive rules that generate intersubjective expectations among financial actors on which the very existence of financial transactions depends.

In other words, financial regulatory paradigms based on ontological individualism understand the collective behavior of financial markets as the result of individual behavior. Thereby, they seek to regulate the individual behavior of financial institutions. In contrast, financial regulatory paradigms based on macrosocial ontology regard the collective behavior of financial markets as being constrained or constructed by social structures. Therefore, they

aim to reconstruct social structures. Despite its emphasis on the role of collective behavior in causing financial instability, macroprudential regulation sees collective behavior as the result of individual behavior and thus seeks to regulate individual behavior because its ontological assumption is individualistic.

Prior to the 2008 financial crisis, global financial regulation was primarily conducted by microprudential regulation based on the principle of strengthening transparency. After the crisis, macroprudential regulation has been added to the financial regulatory framework. New measures such as countercyclical capital buffer and additional regulatory rules for systemically important financial institutions (SIFIs) have been adopted to improve systematic risk management under the new Basel III Accord (Goodhart, 2015; Underhill, 2015). As a result, the post-2008 global financial regulatory framework can be regarded as 'institutional layering' in which microprudential regulation is supplemented by macroprudential policy (Baker, 2013a).

In contrast, considerably less effort has been put into solving the problems caused by structural properties after the 2008 financial crisis. First, hardly any measures have been taken to mitigate the competitive pressure created by financial globalization. For example, the post-1945 Bretton Woods system focused on changing the structural properties of international financial markets by imposing capital controls (Helleiner, 1994). However, after the 2008 financial crisis, little effort was made to proactively control international capital flows.[3] "Globalization, in other words, has not been confronted directly; policy-makers are concentrating instead on taming some of its pre-crisis neo-liberal characteristics" (Helleiner, 2010: 631).

Nor are there any traces of significant changes in relation to financial innovation such as securitization. Even after the financial crisis, international financial organizations have not attempted to directly reform financial innovation itself, arguing that securitization itself is not the cause of the problems raised (Financial Stability Forum, 2008: 10). Consequently, no noticeable strengthening of public regulation has been in place with regards to calculative devices such as risk management models, which served as the basis for securitization. Rather than a reform through public regulation of the ideational social structure, the pre-crisis principle of strengthening transparency through information sharing in the market was applied to improve calculative devices (Stellinga and Mugge, 2017).

The emergence of macroprudential regulation has changed the central focus of financial regulatory paradigm from the soundness of individual institutions on which microprudential regulation focuses into the systemic risks resulting from the complex interactions of individual institutions. However, the nonreductive individualism of macroprudential regulation has not brought about an ontological shift in financial regulation, which can be defined as a change in the central focus of financial regulation from individual actions and interactions into structural properties of global financial markets. As a result, appropriate efforts to reform the structural properties of the financial system have hardly been made.

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[3] A noticeable change in relation to capital controls is that the IMF showed more favorable attitudes towards the limited use of capital controls by developing countries (Chwieroth, 2014).

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